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11. A surface structure as defined in claim 1 wherein said flexible layer has a thickness in a range of about 5 to 10 micrometers.
12. A surface structure as defined in claim 1 wherein said flexible layer has a thickness in a range of about 25 to 250 micrometers.
13. A surface structure as defined in claim 1 wherein said flexible layer has a thickness in a range of about 7.5 to 15 micrometers.
14. A surface structure as defined in claim 1 wherein said flexible layer comprises a polymer layer.
15. A surface structure as defined in claim 1 wherein said flexible layer comprises silicone rubber.
16. A surface structure as defined in claim 1 wherein said flexible layer comprises polydimethylsiloxane.
17. A surface structure as defined in claim 1 wherein said coating has a thickness in a range of about 0.25 to 0.50 micrometers.
18. A surface structure as defined in claim 1 wherein said coating is selected from the group consisting of silicon nitride, silicon carbo-nitride and carbon.
19. A surface structure as defined in claim 1 wherein said coating comprises silicon dioxide.
20. A surface structure as defined in claim 1 wherein said coating is configured for contacting a semiconductor wafer.
21. A surface structure as defined in claim 1 wherein said flexible layer is configured for absorbing vibrations of the support element.

22. A surface structure as defined in claim 1 wherein said coating comprises a chemically inert, low friction material selected to limit particle generation.
23. A surface structure as defined in claim 1 wherein said ripples are rounded at areas of contact with the workpiece.
24. A surface structure as defined in claim 1 further comprising a film on said coating that is selected for compatibility with the workpiece.
25. A surface structure as defined in claim 1 further comprising an adhesive interface layer for adhering said flexible layer to the support element.
26. A method for making a surface structure, comprising the steps of:
forming a flexible layer;
expanding the flexible layer;
applying a coating to the expanded flexible layer; and
contracting the flexible layer to form ripples in said coating.
27. A method as defined in claim 26 wherein the step of expanding the flexible layer comprises heating the flexible layer and wherein the step of contracting the flexible layer comprises cooling the flexible layer.
28. A method as defined in claim 26 wherein the step of forming a flexible layer comprises forming the flexible layer on a support element.
29. A method as defined in claim 28 wherein the step of forming the flexible layer comprises spraying silicone rubber onto the support element.
30. A method as defined in claim 28 wherein the step of forming the flexible layer comprises spinning silicone rubber onto the support element.

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39. Apparatus as defined in claim 38 wherein the ripples on said coating have a localized regular pattern and substantially cover the portion of the surface structure that contacts the workpiece.
40. Apparatus as defined in claim 38 wherein said ripples comprise elongated, parallel ripples in localized areas of the coating.
41. Apparatus as defined in claim 38 wherein said ripples comprise microminiature nodules.
42. Apparatus as defined in claim 38 wherein said ripples have wavelengths parallel to said surface that are less than or equal to the mean free path of the gas at said selected pressure.
43. Apparatus as defined in claim 38 wherein said ripples have amplitudes perpendicular to said surface that are equal to or less than the mean free path of the gas at said selected pressure.
44. Apparatus as defined in claim 38 wherein said ripples are rounded at areas of contact with the workpiece.
45. Apparatus as defined in claim 38 wherein said ripples have wavelengths parallel to said surface on the order of a few micrometers.
46. Apparatus as defined in claim 38 wherein said resilient layer has a thickness in a range of about 5 to 10 micrometers.
47. Apparatus as defined in claim 38 wherein said resilient layer has a thickness in a range of about 2.5 to 250 micrometers.

49. Apparatus as defined in claim 38 wherein said resilient layer comprises a polymer layer.

51. Apparatus as defined in claim 38 wherein said coating has a thickness in a range of about 0.25 to 0.50 micrometers.

53. Apparatus as defined in claim 38 wherein said coating comprises silicon dioxide.

54. Apparatus as defined in claim 38 wherein said surface structure is configured for contacting a semiconductor wafer.

55. Apparatus as defined in claim 38 wherein said surface structure further comprises a film on said coating that is selected for compatibility with the workpiece.

56. Apparatus as defined in claim 38 wherein said surface structure further comprises an adhesive interface layer between the resilient layer and the support element.

57. Apparatus for electrostatic clamping of a workpiece, comprising:

a platen assembly defining an electrically insulating clamping surface for receiving a workpiece, the platen assembly comprising electrodes underlying and electrically isolated from said clamping surface, a dielectric layer between the electrodes and the clamping surface, and a surface structure defining the clamping surface, said surface structure comprising a resilient layer adhered to said dielectric layer and a coating on the resilient layer, said coating having ripples on its surface; and

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a clamping control circuit for applying clamping voltages to the electrodes for electrostatically clamping the workpiece in a fixed position on the clamping surface.

58. Apparatus as defined in claim 57 wherein said resilient layer is thermally
5 conductive.

59. Apparatus as defined in claim 57 wherein said ripples form a regular pattern, at
least in localized areas of the surface, and wherein said ripples cover substantially the
entire area of said clamping surface.

60. Apparatus as defined in claim 57 further comprising a cooling gas system for
introducing a gas at a selected pressure between said coating and the workpiece.

61. Apparatus as defined in claim 60 wherein said ripples have wavelengths parallel
15 to said surface that are less than or equal to the mean free path of the cooling gas at said
selected pressure.

62. Apparatus as defined in claim 60 wherein said ripples have amplitudes
perpendicular to said surface that are less than or equal to the mean free path of the
20 cooling gas at said selected pressure.

63. Apparatus as defined in claim 57 wherein said resilient layer has a thickness in a
range of about 5 to 10 micrometers.

64. Apparatus as defined in claim 57 wherein said resilient layer comprises silicone
25 rubber.

65. Apparatus as defined in claim 57 wherein said coating has a thickness in a range
of about 0.25 to 0.50 micrometers.

66. Apparatus as defined in claim 57 wherein said coating is selected from the group
30 consisting of silicon nitride, silicon carbo-nitride and carbon.

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1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	